

**Focused Site Inspection Prioritization**

**Banner Western Disposal Service  
USEPA ID No. ILT 180 010 068**

**September 7, 1995**

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U.S. Environmental Protection Agency  
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**For U.S. Environmental Protection Agency, Region V**

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## **1.0 Introduction**

On December 13, 1994, the Alternative Remedial Contracting Strategy (ARCS) V contractor was authorized, by approval of the work plan amendment by the U.S. Environmental Protection Agency (USEPA) Region V, to conduct a focused site inspection prioritization (FSIP) of the Banner Western Disposal Service site in Joliet, Will County, Illinois.

The site was initially placed on the Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) on January 1, 1984, as a result of a request for discovery action initiated by the USEPA.

The facility received its initial Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) evaluation in the form of a preliminary assessment (PA) report completed by IEPA, also on January 1, 1984. In April 1989, the USEPA Field Investigation Team contractor conducted a screening site inspection report (SSI), which included the collection and analysis of eight surface soil/sediment samples, and four residential well samples. The sampling portion of the FSIP was conducted on March 29, 1995, when the ARCS V contractor field team collected eight sediment samples.

The objective of the FSIP is to review the outstanding SSIs performed before the implementation of the revised Hazard Ranking System (HRS) for which a final decision has not been made regarding further action. The FSIP will determine whether the existing SSI information meets a minimum standard to reflect the revised HRS and if not, collect additional information by file review, reconnaissance and sampling on an as-needed basis. The FSIP will evaluate the threats posed to human health and the environment and provide sufficient documentation for USEPA to decide the appropriate future course of action (No Further Remedial Action Planned, further evaluation, or preparation of HRS scoring package).

## **2.0 Site Background**

### **2.1 Introduction**

This section includes information obtained during the FSIP and from reports of previous site activities.

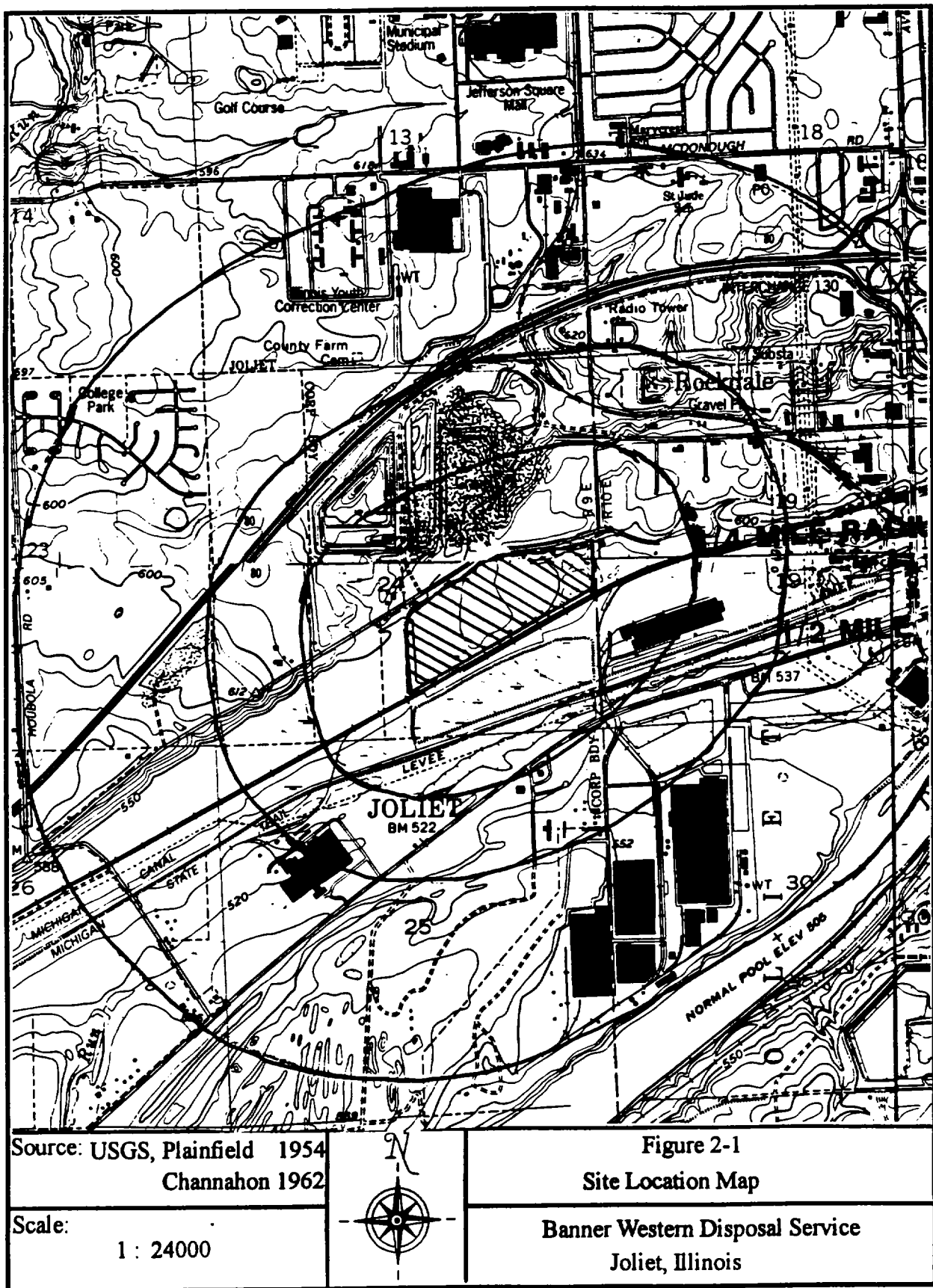
### **2.2 Site Description**

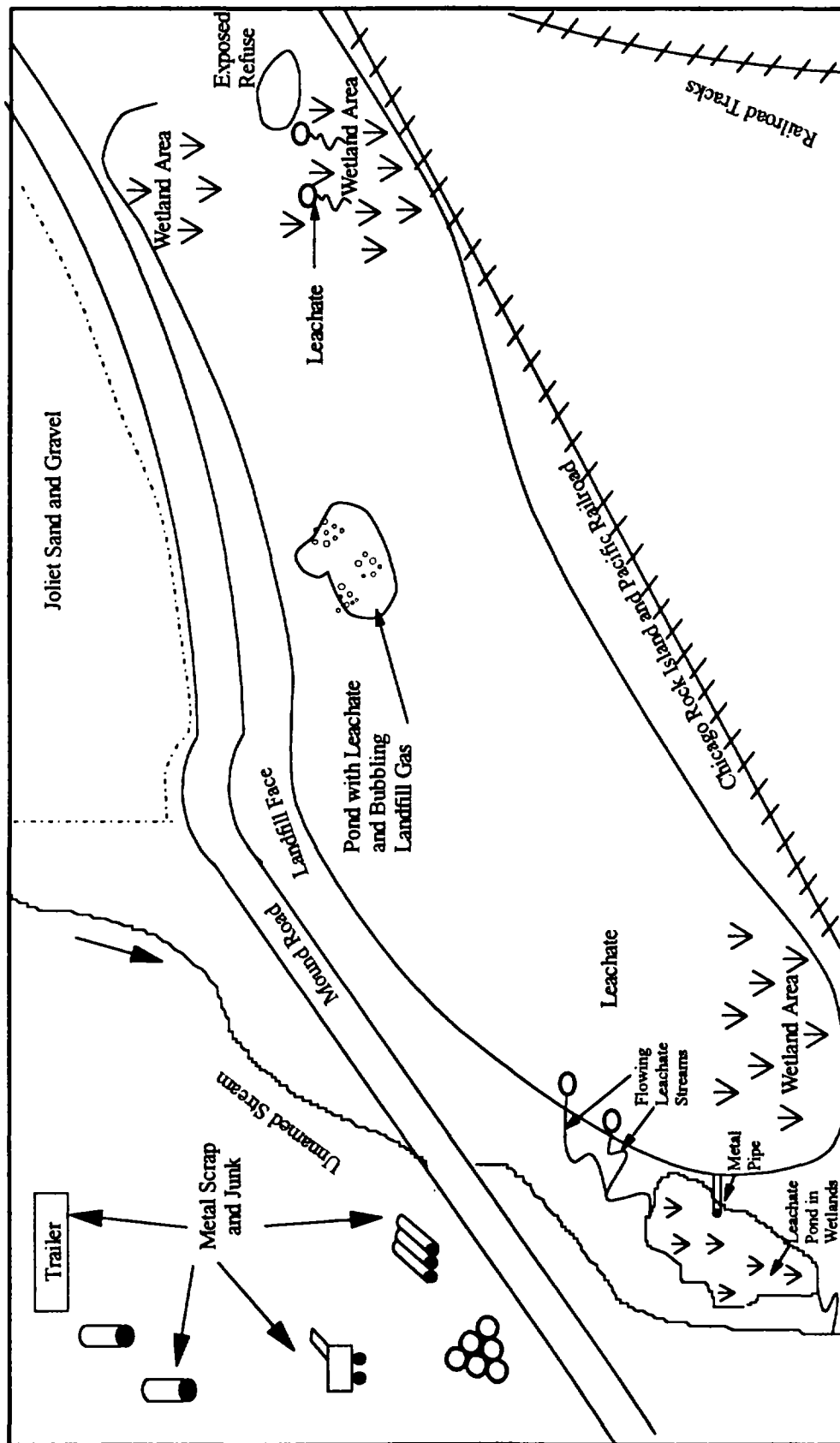
The Banner Western Disposal Service site is an inactive 45-acre landfill located on a 60-acre parcel approximately 0.5 miles west of Rockdale in Will County, Illinois (northwest quarter of the southeast quarter of Section 24, Township 35 North, Range 9 East). Figure 2-1 is a site location map; Figure 2-2 is a site sketch.

No records are available indicating the types or volume of wastes disposed of at the site. IEPA inspected the site on September 30, 1976, and found the landfill was satisfactorily closed and covered with more than 2 feet of graded clay material (E&E 1990).

The landfill has no onsite structures and is relatively level with some low areas. Wetlands are near the southwestern site corner and along the eastern property boundary. The site is not fenced and is easily accessible. An unnamed stream flows along the western site border. This stream appears to be fed by the dewatering discharge from a gravel operation to the north (Joliet Sand and Gravel [JSG]). The unnamed stream discharges to the Illinois & Michigan (I&M) Canal, approximately 0.2 miles south of the site. Several stockpiles of material from JSG are east of the site. The landfill is not contained, and leachate flows toward the unnamed stream, forming a pond around a wetland area. Overflow from the leachate pond was observed flowing into the unnamed stream. The site appears to have recreational use because a treehouse was observed onsite and shotgun shells and clay pigeons were observed on the ground (ARCS V Contractor 1995).

The site is located in a rural area. The site is bounded by Mound Road to the north; an unnamed stream to the west; a Chicago, Rock Island and Pacific Railroad line to the south; and a wetland area to the east. Surrounding land uses within 0.25 miles of the site include a gravel mining operation (JSG) across Mound Road to the north, an active landfill to the northwest, the I&M Canal and wetland areas to the south, and eight private residences. General land use within 4 miles includes private residential areas, small industrial areas to the south and east, and agricultural





Source:

ARCS Contractor  
Site Reconnaissance, 1995

Figure 2-2  
Site Sketch

Banner Western Disposal Services  
Joliet, Illinois

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areas to the west (ARCS V Contractor 1995). Appendix A includes the 4-mile radius and 15-mile target distance map.

## **2.3 Site History**

### **2.3.1 Operational History**

Members of the Fred D. Bennitt family have owned the property since the 1890s. The site property is currently held in trust #2203, which has been administered by the First Midwest Bank since 1976, and is part of the Fred D. Bennitt estate. Reportedly, the site began operating as an unpermitted landfill in the 1960s, before IEPA regulations were written. Banner Disposal Service of Joliet operated the landfill from 1968 until 1971. From 1971 to 1973, the site was operated by Waste Management of Illinois. In 1976, three years after operations ceased, the landfill was covered with clay and IEPA declared it closed (E&E 1990).

Little is known about site operations. Wastes were accepted for several years with little or no regulatory involvement. No records exist for waste types or volumes of wastes accepted. Waste was reportedly buried in trenches on about 75 percent of the site property. The site is in a gravel mining area, and may have been a gravel pit at one time. No liner or leachate collection system exists onsite.

### **2.3.2 Summary of Onsite Environmental Work**

IEPA records indicate operational violations were documented during inspections, including operating an unregistered landfill. In 1973, it is unclear whether leachate from the site caused a fishkill in the I&M Canal. During inspections, operational violations cited include insufficient cover, unacceptable cover material, blowing litter, leachate releases into the stream, and improperly spreading and compacting refuse.

In April 1989, the USEPA Field Investigation Team contractor collected ten soil/sediment and four residential groundwater well samples as part of an SSI. Six soil/sediment samples were collected onsite to determine waste characteristics of the site; two samples were collected from the unnamed stream; and two samples were used as background samples. All samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), and inorganic analytes found on the USEPA target compound list (TCL) and target analyte list (TAL). Chloroethane was the only chemical detected in a downgradient residential well sample at a

concentration greater than the upgradient well samples. Several TCL compounds and TAL analytes were detected in onsite soil/sediment samples, including toluene, ethylbenzene, total xylenes, heptachlor, cadmium, chromium, and 14 polynuclear aromatic hydrocarbons (PAHs). Naphthalene, cadmium, mercury, and cyanide were detected in a sediment sample at concentrations greater than the upstream sample (E&E 1990). No additional remedial actions or other regulatory actions have been conducted.

Current environmental activity at the Banner Western Disposal Service site is limited to this FSIP.

## **2.4 Applicability of Other Statutes**

The Banner Western Disposal Service site was first listed on the CERCLIS site/event list for Illinois on January 1, 1984, under identification number ILT 180 010 068 (USEPA 1995). The site is listed as a transporter on the Resource Conservation and Recovery Act notifiers list (USEPA 1994).

## **3.0 Site Inspection Activities and Analytical Results**

### **3.1 Introduction**

This section outlines procedures used and observations made during the FSIP conducted at the Banner Western Disposal Service site. Sampling activities were conducted in accordance with the quality assurance project plan (QAPjP) (ARCS V Contractor 1991).

Samples collected for this FSIP were analyzed for organic and inorganic substances contained on the USEPA TCL and TAL by USEPA contract laboratory program (CLP) participant laboratories. Appendix B presents the TCL and TAL. Appendix C presents a summary of all analytical data generated by FSIP sampling. Appendix D contains photographs of the site and sample locations.

### **3.2 Site Reconnaissance**

On February 16, 1995, a reconnaissance of the Banner Western Disposal Service site was conducted. This visit included a visual site inspection to determine the status of the site, to identify health and safety hazards, and to identify potential sampling locations.

The central portion of the site is level with a grass cover. A large, flowing leachate stream was flowing from the west-central face of the landfill. The leachate was orange with an oily sheen and had a chemical odor. The leachate ponded in the southwestern site corner. Another large leachate pond was discovered in the southeastern site corner. A 5-foot diameter storage tank with unknown contents had a leaking valve that was protruding from the southwestern face of the landfill. Wetland areas were observed on the southwestern and western boundaries, the southeastern corner, and the northeastern site corner. Two residences were identified near the site. One was directly across the street from the site at 2849 Mound Road, and another was approximately 300 feet northwest of the site at 2700 Mound Road.

Before sampling activities, a site walk-through was conducted on March 29, 1995. On the northeastern portion of the site, large quantities of landfill gas were bubbling up through a 20-foot diameter pond. An active, flowing leachate seep was observed flowing into the unnamed stream along the western site boundary. A second landfill may have also been discovered offsite, along the unnamed stream between the Banner site and the I&M Canal. A culvert from an approximately 30-acre elevated

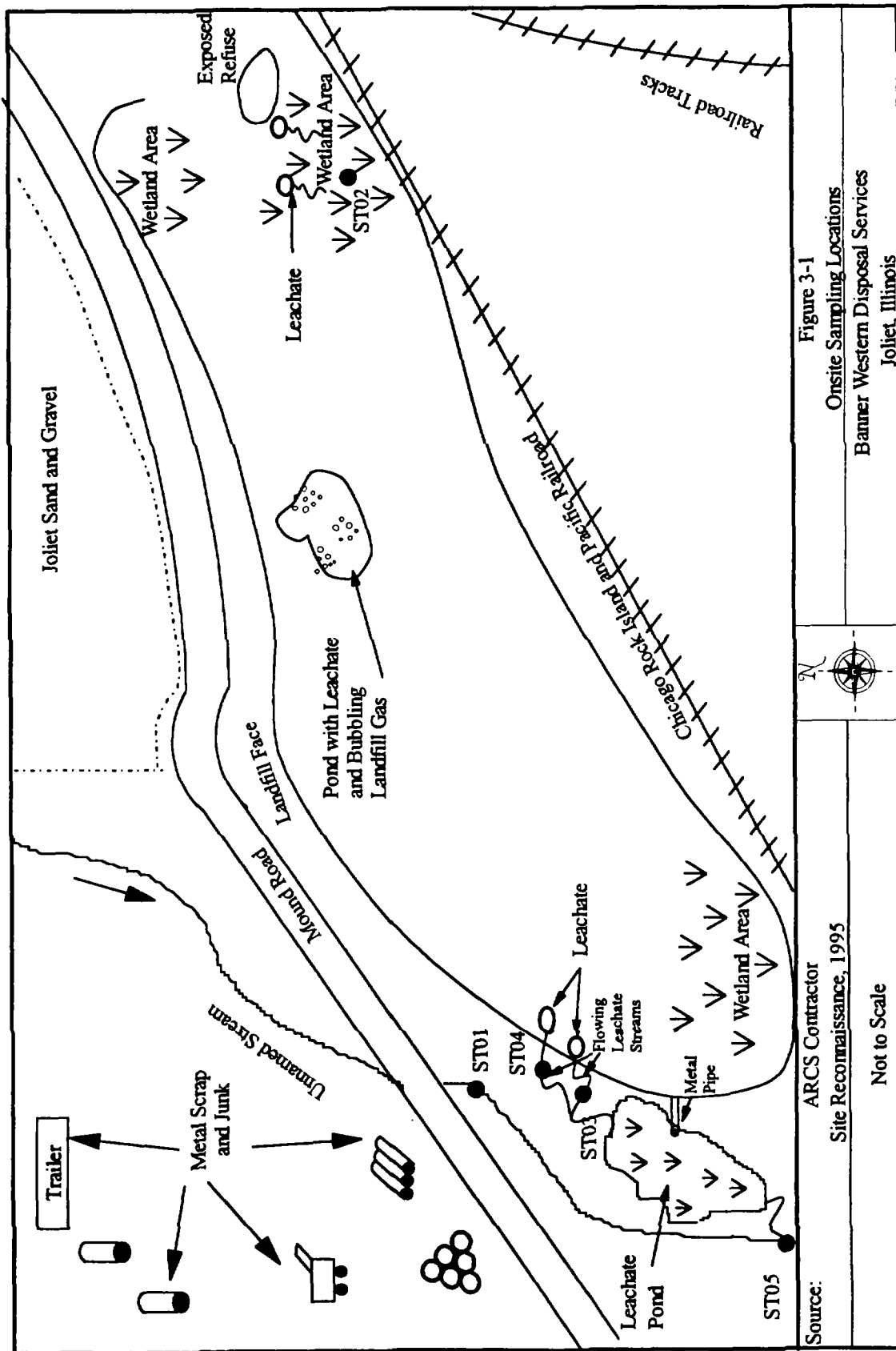
area was observed with leachate seeping from the culvert into the unnamed stream. Based on this observation, an additional sediment sample (ST08) was later collected to determine the possible influences of other potential source areas along the unnamed stream.

### **3.3 Site Representative Interview**

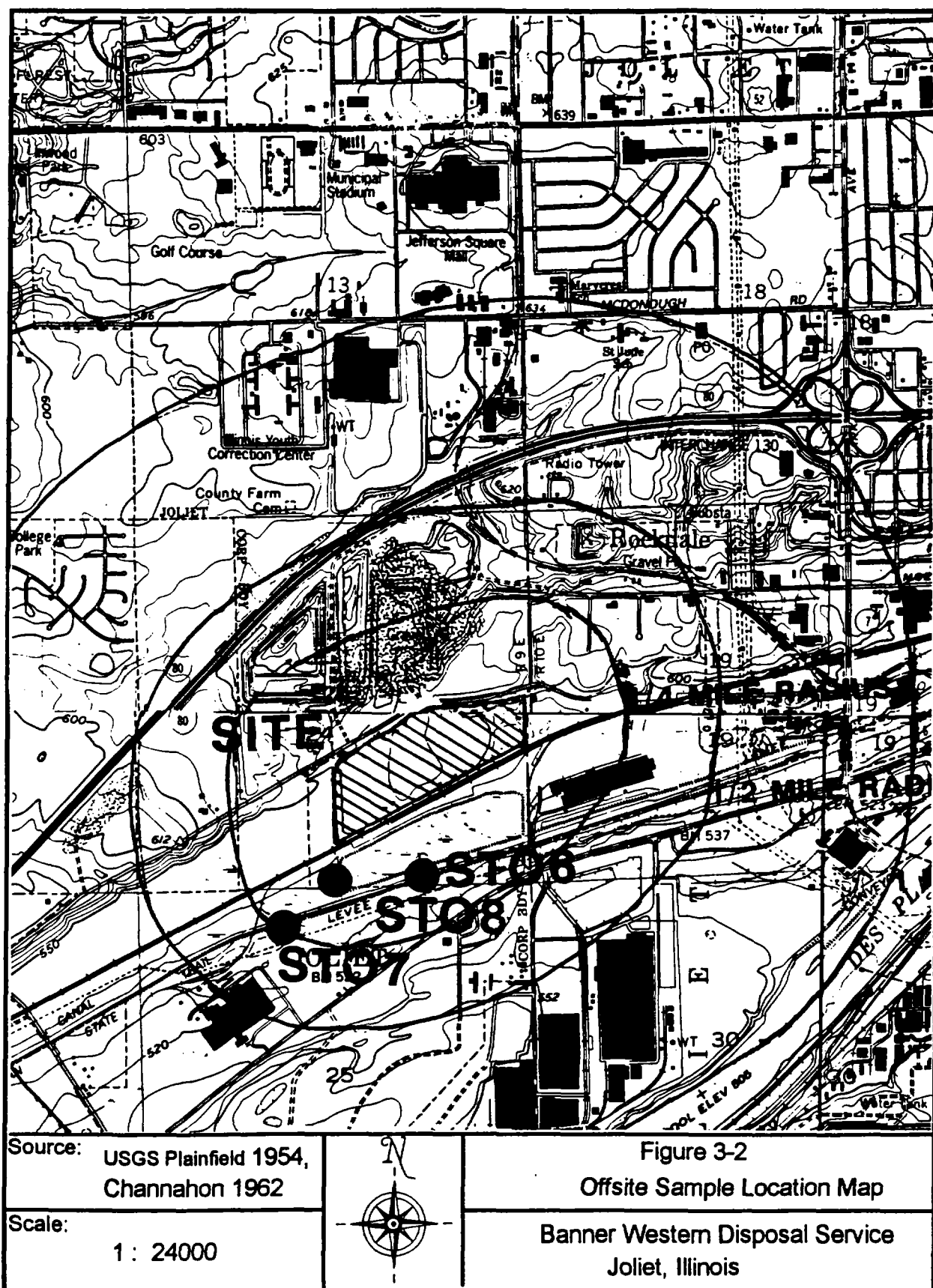
No site representatives were present during the February 16, 1995, site visit because site owners were not notified of the site reconnaissance until after the visit due to owner identification problems resulting from the land trust. Therefore, the initial site visit did not include an interview.

### **3.4 Surface Water Sampling**

On March 29, 1995, the ARCS V contractor field team collected eight sediment samples from onsite areas, the unnamed stream, and the I&M Canal. Split samples were provided to representatives of the Banner Western Disposal Service site. Sediment sample ST01 was collected in the unnamed stream approximately 10 feet south of Mound Road. ST01 will serve as the background sediment sample. Sediment sample ST02 was collected from a wetland area on the eastern side of the site to document any contaminants from the landfill. Sediment samples ST03 and ST04 were collected from two leachate seeps on the western side of the site, and will be used to attribute contaminants migrating from the landfill. Sediment samples ST05 and ST08 were collected in the unnamed stream. ST05 was collected where the leachate pond enters the unnamed stream. ST08 was collected approximately 600 feet downstream of ST05, and immediately downstream of the leachate seep observed during the offsite reconnaissance. ST08 will be used to document the possible influence of other potential sources observed along the unnamed stream. Sediment sample ST06 was collected in the I&M Canal, approximately 600 feet upstream of the confluence of the unnamed stream and the I&M Canal, to document the influence of other potential source areas upstream along the I&M Canal. Sediment sample ST07 was collected in the I&M Canal approximately 50 feet downstream of the confluence of the unnamed stream and I&M Canal. ST07 will be used to determine the potential for contaminants to have migrated from the Banner site to the I&M Canal. Figure 3-1 shows onsite sample locations. Figure 3-2 shows offsite sample locations. Table 3-1 provides a summary of sample locations and descriptions.



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<p align="center"><b>Table 3-1</b>  <b>Sample Descriptions</b>  <b>Banner Western Disposal Service</b></p>			
<b>Sample</b>	<b>Depth (in inches)</b>	<b>Appearance</b>	<b>Location</b>
ST01	0 - 6	Sand and gravel with some silt	The unnamed stream 10 feet south of Mound Road to establish background concentrations.
ST02	0 - 6	Brown silt with sand and gravel	The wetland area near the southeastern site corner.
ST03	0 - 6	Black silt with gravel	Leachate stream flowing into the leachate pond in the southwestern site corner.
ST04	0 - 6	Black silt with gravel	The second leachate stream flowing along the western side of the site.
ST05	0 - 6	Gray to brown silt with sand and gravel	The unnamed stream where the leachate pond enters the unnamed stream.
ST06	0 - 6	Black silt	The I&M Canal approximately 600 feet upstream of the confluence of the I&M Canal and the unnamed stream.
ST07	0 - 6	Silt	The I&M Canal approximately 50 feet downstream of the confluence of the I&M Canal and the unnamed stream.
ST08	0 - 6	Black/brown silt with some sand and gravel	The unnamed stream approximately 600 feet downstream of ST05.

Sample jars were sealed, labeled, packaged, and transported to USEPA CLP participant laboratories in accordance with procedures set forth in the QAPjP.

Sediment samples scheduled for organic analyses were shipped to Southwest Labs of Oklahoma, in Broken Arrow, Oklahoma, on March 29, 1995. Sediment samples scheduled for inorganic analyses were shipped to Industrial Environmental Analysts, Inc., in Cary, North Carolina, on March 29, 1995. Samples were analyzed for TCL and TAL substances under a routine analytical services request.

All reusable sampling and personal protective equipment were decontaminated before transport offsite. Disposable sampling items and personal protective equipment were discarded in accordance with procedures outlined in the FSIP project work plan and the QAPjP.

### **3.5 Analytical Results**

This section summarizes analytical results from FSIP samples. Appendix C presents all FSIP analytical data.

Laboratory analysis of the sediment samples revealed VOCs, SVOCs, pesticides/PCBs, and inorganic analytes.

### **3.6 Key Samples**

Key samples are those samples that contain substances in sufficient concentration to document an observed release. Table 3-2 identifies FSIP key samples.

The key sediment samples revealed the presence of 5 VOCs, 16 SVOCs, 16 pesticides/PCBs, and 16 inorganic analytes.

Table 3-2  
Key Sample Summary

Sediment (Concentrations in $\mu\text{g/kg}$ ; Metals in $\text{mg/kg}$ )									
Substance	Sample Number								
	ST01 Background	ST02	ST03	ST04	ST05	ST06	ST07	ST08	
Acetone	13 UJB	97B							
1,1-Dichloroethane	13 U	23							
Toluene	13 U	35	23 J						
Ethylbenzene	13 U	45	74 J						
Xylene (total)	13 U	83	260 J	97 J					
Naphthalene	430 U			1,600					
2-Methylnaphthalene	430 U			840					
Acenaphthylene	430 U			650		820			
Fluorene	430 U			540 J					
Phenanthrene	58 J			4,900		1,200	300 J	400 J	
Anthracene	430 U			2,100					
Fluoranthene	95 J			10,000 D		2,400	820	880	
Pyrene	110 J			15,000 D		4,100 D	1,000	980	
Benzo(a)anthracene	52 J			4,700		3,500	800	540 J	
Chrysene	73 J			9,100 D		4,400	1,000	750	
Bis(2-Ethylhexyl)phthalate	430 U			9,400 JBD					
Benzo(b)fluoranthene	49 J			14,000		4,200 D	1,400	970	

Table 3-2  
Key Sample Summary

Sediment (Concentrations in $\mu\text{g/kg}$ ; Metals in $\text{mg/kg}$ )									
Substance	Sample Number								
	ST01 Background	ST02	ST03	ST04	ST05	ST06	ST07	ST08	
Benzo(a)pyrene	54 J			8,000 D	160 J	4,500 D	990	570 J	
Indeno(1,2,3-cd)pyrene	34 J			7,700 D	140 J	3,200	760	360 J	
Dibenz(a,h)anthracene	430 U			850		1,400			
Benzo(g,h,i)perylene	34 J			7,600 D		2,800	600	280 J	
Delta-BHC	2.2 U			6.3 JP					
Gamma-BHC (Lindane)	2.2 U			27 JP					
Aldrin	2.2 U	4.8 P		22 JP					
Dieldrin	4.3 U			57 JP		39 JP			
4,4'-DDE	4.3 U			82 JP					
Endrin	4.3 U			56 JDP		53 J	7.9 P	6.9 JP	
Endosulfan II	4.3 U			44 JP					
4,4'-DDD	4.3 U			100 JP			5.6 P		
Endosulfan sulfate	4.3 U			27 JP					
4,4'-DDT	4.3 U			61 JP		22 J	8.6 P		
Methoxychlor	22 U			150 J					
Endrin ketone	4.3 U			96 J		13 JP	9.0		
Endrin aldehyde	4.3 U	7.5	4.4 P	97 JP			23 P		

Table 3-2  
Key Sample Summary

Sediment (Concentrations in $\mu\text{g/kg}$ ; Metals in $\text{mg/kg}$ )									
Substance	Sample Number								
	ST01 Background	ST02	ST03	ST04	ST05	ST06	ST07	ST08	
Alpha-chlordane	2.2 U	3.0		39 JP					
Gamma-chlordane	2.2 U			37 JP					
Aroclor-1254	43 U	210 C		9,900 UX					
Metals									
Aluminum	1,630 J	6,720 J	9,570 J	9,080 J		8,170 J	11,500 J	9,480 J	
Arsenic	4.5		21.2			30.1		14.2	
Barium	14.3 B	59.3	307	78.2		175	84.6	95.5	
Cadmium	0.37 B		65.4	4.6		9.8	2.5	4.3	
Chromium	3.8	13.9	523	51.4		136	34.5	29.7	
Copper	4.5 B	16.7	408	38.4		174	56.9	38.9	
Iron	7,240		23,200	26,400				22,200	
Lead	3.9	24.5	564	49.1	12.2	443	50.2	34.4	
Mercury	0.10 U		5.2	0.89		4.1	0.25		
Nickel	6.0 B	19.4	105	20.1		32.8	29.5	36.6	
Selenium	0.55 U		2.1 B			1.5 B		1.3 B	
Silver	0.18 U		11.6	0.99 B		4.3			
Sodium	225 B	2,130	1,510 B						

Table 3-2  
Key Sample Summary

		Sediment (Concentrations in $\mu\text{g/kg}$ ; Metals in $\text{mg/kg}$ )							
		Sample Number							
Substance	ST01 Background	ST02	ST03	ST04	ST05	ST06	ST07	ST08	
Vanadium	6.5 B		23.0	26.4		21.8	26.2	22.0	
Zinc	19.6	67.1	2,380	195	61.3	826	205	398	
Cyanide	2.0 U		8.3						

Notes:

- J Reported value is estimated.
- U Substance is undetected. The reported value is the contract required quantitation limit (CRQL).
- P Greater than 25 percent difference for detected concentrations.
- C Identification has been confirmed by GC/MS.
- X Other specific flags may be required to properly define the results.
- D Compound identified in an analysis at a secondary dilution factor.
- B Analyte found in the associated blank as well as in the sample.

## **4.0 Characterization of Sources**

### **4.1 Introduction**

Analysis of FSIP samples led to the identification of one source area, the landfill, at the Banner Western Disposal Service site.

### **4.2 Landfill**

#### **4.2.1 Description**

Analyses of FSIP onsite sediment samples ST02, ST03, and ST04 indicate an observed release of VOCs, SVOCs, pesticides/PCBs, and inorganic analytes. The source area is approximately 45 acres.

Little is known about site operations. Wastes were accepted for several years with little or no regulatory involvement. No records exist for waste types or volumes of wastes accepted. Waste was reportedly buried in trenches on about 75 percent of the site property. The site is in a gravel mining area and may have been a gravel pit at one time. No liner or leachate collection system exists onsite.

#### **4.2.2 Waste Characteristics**

Analysis of the two sediment samples collected (ST02 and ST03) from leachate streams flowing from the landfill in the southwest portions of the site indicated the presence of 5 VOCs, 16 SVOCs, 16 pesticides/PCBs, and 16 inorganic analytes. All of these chemicals are considered to be attributable to the landfill.

Analytical data indicates that migration of 24 potential contaminants from the landfill area has affected the surface water pathway. Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, endrin, 4,4'-DDD, endrin aldehyde, aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, nickel, selenium, vanadium, and zinc were detected in onsite sediment sample ST04, and also detected downstream in samples ST05 or ST08 located in the unnamed stream. This causes the surface water pathway to be the primary pathway of concern. A potential also exists for affecting the groundwater and air. Detected chemicals may leach down through the sediment and soil to the groundwater, or they may be entrained and transported in the air pathway as airborne particulate matter.

## **5.0 Discussion of Migration Pathways**

### **5.1 Introduction**

This section includes information useful in analyzing the potential impact of contaminants found at the Banner Western Disposal Service site on the four migration pathways: groundwater, surface water, air, and soil.

### **5.2 Groundwater**

No groundwater well samples were collected as part of this FSIP. During the 1989 SSI, chloroethane was the only chemical detected in a downgradient groundwater sample (30 parts per billion) at a concentration greater than in the upgradient sample, but could not be attributed to the Banner site. Chloroethane was not detected at elevated levels in other migration pathways during this FSIP.

Information regarding the geology of the site area indicates the presence of three major water-bearing units. The three aquifers, in descending order, are a sand and gravel Quaternary drift deposit, a Silurian dolomite bedrock formation, and the Cambrian-Ordovician aquifer system, which is a sequence of hydraulically connected Ordovician and Cambrian age dolomite and sandstone formations (Woller and Sanderson 1983, Lineback 1979, Willman and Others 1967).

According to well logs in the area, the Quaternary drift aquifer and the Silurian dolomite bedrock aquifer appear to be hydraulically connected, and together form the aquifer of concern (AOC). The Ordovician Maquoketa Shale Formation, a known aquitard, lies between the AOC and the lower Cambrian-Ordovician aquifer system (Woller and Sanderson 1983). The Quaternary drift deposit ranges in thickness from 5 to 100 feet, and is composed of generally well-sorted, well-bedded sands and gravels near the site, and interbedded clay till units with sand and gravel lenses further away from the site (Woller and Sanderson 1983, Lineback 1979). The Silurian dolomite bedrock formation varies in thickness from 100 to 150 feet in the area, and is described as almost entirely dolomite that varies from extremely argillaceous, silty, and cherty to exceptionally pure (Willman 1979). The Cambrian-Ordovician aquifer system ranges in depth from 500 to 2,000 feet below ground surface (Woller and Sanderson 1983).

Potable water within a 4-mile radius of the site is obtained from public and private wells. Municipal water is served by the City of Rockdale, the City of Joliet, Cresthill, Shorewood, and Clearview subdivisions, and the Modern Mobile Home

— Park. The City of Joliet operates 13 wells from a blended system that draws all its water from the Cambrian-Ordovician aquifer system and serves approximately 78,000 people. Three City of Joliet wells are located within 4 miles of the site. The City of Rockdale operates one municipal well located 1.5 miles from the site that serves approximately 1,709 people. This well also draws water from the Cambrian-Ordovician aquifer system. Cresthill operates a total of five wells in a blended system that serves approximately 9,252 people. Three Cresthill wells are located within 4 miles of the site. Two wells are screened in the upper Silurian aquifer, and one well is screened in the lower Cambrian-Ordovician aquifer. Shorewood operates a total of four wells in a blended system that serves approximately 1,600 people. Two Shorewood wells are within 4 miles of the site; one well draws water from the upper Silurian aquifer, and one well draws water from the lower Cambrian-Ordovician aquifer. The Clearview subdivision operates two wells which serve approximately 315 people. The two Clearview wells are located within 4 miles of the site, and draw water from the upper Silurian aquifer. The Modern Mobile Home Park operates a total of two wells in a blended system that serves approximately 50 people. Both wells are within 3 miles of the site; one well draws water from the upper Silurian aquifer, and one well draws water from the lower Cambrian-Ordovician aquifer (Illinois State Water Survey 1995, Woller and Sanderson 1983).

A topographic housecount was used to estimate that approximately 1,674 private wells serve approximately 4,989 residents within 4 miles of the site (U.S. Department of Commerce [USDC] 1990, USGS 1993). Populations associated with each private well were determined using an average of 2.98 persons per household for Will County (USDC 1990). The nearest well drawing water from the Quaternary drift aquifer is assumed to be a private well located at a residence approximately 300 feet northwest of the site (ARCS V Contractor 1995).

It is estimated that a total of 31,423 people use potable water within 4 miles of the site, and are radially distributed as follows: 0-1/4 mile, 9 people; 1/4-1/2 mile, 60 people; 1/2-1 mile, 149 people; 1-2 miles, 2,010 people; 2-3 miles, 7,550 people, and 3-4 miles, 21,645 people (Illinois State Water Survey 1995, USGS 1993, Woller and Sanderson 1983).

### **5.3 Surface Water**

An unnamed stream flows along the western site border. Two leachate streams flow overland west into a leachate pond that then drains to the unnamed stream.

The probable point of entry (PPE) is where the leachate pond stream enters the unnamed stream. The unnamed stream flows south approximately 0.21 mile and then enters the I&M Canal. According to a public service administrator with the Illinois Department of Natural Resources and the U.S. Department of Interior National Wetlands Inventory Maps, the I&M Canal is an intermittent surface water body (Illinois Department of Natural Resources [IDNR] 1995, USDI 1983). Therefore, the surface water pathway target distance limit terminates in the unnamed stream. The site is located in a 100-year floodplain (Federal Emergency Management Agency 1982).

As part of the FSIP, five offsite sediment samples and three onsite sediment samples were collected. Sediment sample ST01 was collected as a background sample. Sediment samples ST02, ST03, and ST04 were collected onsite to document the release of potential contaminants from the landfill. ST05 was collected in the unnamed stream at the PPE, and ST08 was collected in the unnamed stream 0.10 miles downstream of the PPE. Sediment sample ST06 was collected 0.11 miles upstream of the confluence of the unnamed stream and the I&M Canal. Sample ST07 was collected in the I&M Canal 0.01 miles downstream of the confluence of the unnamed stream and the I&M Canal, 0.22 miles downstream of the PPE. Analytical results revealed the presence of contaminants in ST05, ST07, and ST08 that can be attributed to the Banner site.

According to the National Wetlands Inventory maps, there are no wetlands along the surface water pathway. The unnamed stream is not a fishery (IDNR 1995). The flow rate for the unnamed stream is estimated to be 3 cubic feet per second (ARCS V Contractor 1995). No known surface water intakes exist along the surface water pathway (IDNR 1995). No habitats for any threatened or endangered species are located along the surface water pathway (Illinois Department of Conservation [IDOC] 1994).

## **5.4 Air**

No documented air releases are known and none was observed during the FSIP; however, the presence of chemicals at or near the ground surface creates the potential for windblown particulates to carry chemicals to neighboring residences.

An estimated 64,803 people live within 4 miles of the site (USEPA 1980, USGS 1993). The City of Joliet is located within the 4-mile target distance ring. There are three residences within 0.25 miles of the site. No residences are within 200 feet of

the site property (ARCS V Contractor 1995). Sensitive environments within 4 miles of the site include habitats for six state threatened or endangered species and seven state natural areas (IDOC 1994). Approximately 1,056 acres of wetland areas are located within the 4-mile target distance ring (USDI 1983).

## **5.5 Soil**

No surface soil samples were collected at the Banner Western Disposal Service site during this FSIP. The site is not fenced, is easily accessible, and has recreational use (ARCS V Contractor 1995). No residences are within 200 feet of the site. Approximately 316 people reside within 1 mile of the site (USGS 1993).

## **6.0 References**

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Appendix A

***Banner Western Disposal Service***

4-Mile Radius Map  
15-Mile Surface Water Route Map

# SDMS US EPA Region V

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Appendix A – 4-mile radius map, surface water route map

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Appendix B

***Banner Western Disposal Service***

Target Compound List and  
Target Analyte List

## Target Compound List

### Volatiles

Chloromethane	1,2-Dichloropropane
Bromomethane	Cis-1,3-Dichloropropene
Vinyl Chloride	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride	1,1,2-Trichloroethane
Acetone	Benzene
Carbon Disulfide	trans-1,3-Dichloropropane
1,1-Dichloroethene	Bromoform
1,1-Dichloroethane	4-Methyl-2-pentanone
1,2-Dichloroethene (total)	2-Hexanone
Chloroform	Tetrachloroethene
1,2-Dichloroethane	Toluene
2-Butanone	1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride	Ethyl benzene
Bromodichloromethane	Styrene
	Xylenes (total)

Source: Target Compound List for water and soil with low or medium levels of volatile and semivolatile organic contaminants, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

## Target Compound List (Continued)

### Semivolatiles

Phenol	Acenaphthene
bis(2-Chloroethyl) ether	2,4-Dinitrophenol
2-Chlorophenol	4-Nitrophenol
1,3-Dichlorobenzene	Dibenzofuran
1,4-Dichlorobenzene	2,4-Dinitrotoluene
1,2-Dichlorobenzene	Diethylphthalate
2-Methylphenol	4-Chlorophenyl-phenyl ether
2,2-oxybis-(1-Chloropropane)*	Fluorene
4-Methylphenol	4-Nitroaniline
N-Nitroso-di-n-dipropylamine	4,6-Dinitro-2-methylphenol
Hexachloroethane	N-Nitrosodiphenylamine
Nitrobenzene	4-Bromophenyl-phenyl ether
Isophorone	Hexachlorobenzene
2-Nitrophenol	Pentachlorophenol
2,4-Dimethylphenol	Phenanthrene
bis(2-Chloroethoxy) methane	Anthracene
2,4-Dichlorophenol	Carbazole
1,2,4-Trichlorobenzene	Di-n-butylphthalate
Naphthalene	Fluoranthene
4-Chloroaniline	Pyrene
Hexachlorobutadiene	Butyl benzyl phthalate
4-Chloro-3-methylphenol	3,3-Dichlorobenzidine
2-Methylnaphthalene	Benzo(a)anthracene
Hexachlorocyclopentadiene	Chrysene
2,4,6-Trichlorophenol	bis(2-Ethylhexyl)phthalate
2,4,5-Trichlorophenol	Di-n-Octylphthalate
2-Chloronaphthalene	Benzo(b)fluoranthene
2-Nitroaniline	Benzo(k)fluoranthene
Dimethylphthalate	Benzo(a)pyrene
Acenaphthylene	Indeno(1,2,3-cd)pyrene
2,6-Dinitrotoluene	Dibenzo(a,h)anthracene
3-Nitroaniline	Benzo(g,h,i)perylene

\*Previously known by the name of bis(2-chloroisopropyl)ether.

Source: Target Compound List for water and soil with low or medium levels of volatile and semivolatile organic contaminants, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

## Target Compound List (Continued)

### Pesticide/PCB

alpha-BHC	4,4-DDT
beta-BHC	Methoxychlor
delta-BHC	Endrin ketone
gamma-BHC (Lindane)	Endrin aldehyde
Heptachlor	alpha-chlordane
Aldrin	gamma-chlordane
Heptachlor epoxide	Toxaphene
Endosulfan I	Aroclor-1016
Dieldrin	Aroclor-1221
4,4-DDE	Aroclor-1232
Endrin	Aroclor-1242
Endosulfan II	Aroclor-1248
4,4-DDD	Aroclor-1254
Endosulfan sulfate	Aroclor-1260

Source: Target Compound List for water and soil containing less than high concentrations of pesticides/aroclor, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

### Target Analyte List

Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Thallium
Copper	Vanadium
Iron	Zinc
Lead	Cyanide

Source: Target Analyte List in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Appendix C

***Banner Western Disposal Service***

**Analytical Results**

## Appendix C

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## Data Reporting Qualifiers

### Definitions for Organic Chemical Data Qualifiers

- U - Indicates compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.
- J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria, but the result is less than the sample quantitation limit ~~but~~ <sup>and</sup> greater than zero.
- P - This flag is used for a pesticide Aroclor target analyte <sup>?</sup> when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported and flagged with a "P".
- C - This flag applies to results where identification has been confirmed by GC/MS.
- B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag must be used for a TIC as well as for a positively identified TCL compound
- D- This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- X - Other specific flags may be required to properly define the results. The "X" flags are fully described on the data tables.

## **Data Reporting Qualifiers**

### **Definitions for Inorganic Chemical Data Qualifiers**

- U -** Indicates compound was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- J -** Indicates an estimated value.
- B -** Indicates that the reported value is less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).

**Table C-1**  
**Volatile Organic Analysis for Sediment Samples**  
**Banner Western Disposal Service**

Volatile Compound	Sample Numbers / Concentrations in ug/kg							
	ST01	ST02	ST03	ST04	ST05	ST06	ST07	ST08
Chloromethane	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
Bromomethane	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
Vinyl Chloride	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
Chloroethane	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
Methylene Chloride	26 UJB	2 J	15 J	19 UJB	14 UJ	17 UJB	17 U	18 UJB
Acetone	13 UJB	97 B	16 UB	30 UJB	14 UJB	17 UJB	17 UJB	30 UJB
Carbon Disulfide	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
1,1-Dichloroethene	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
1,1-Dichloroethane	13 U	23	12 U	19 UJ	14 U	17 U	17 U	18 U
1,2-Dichloroethene (total)	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
Chloroform	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
1,2-Dichloroethane	13 U	15 U	12 U	19 UJ	14 U	17 U	17 U	18 U
2-Butanone	13 U	15 UJB	12 UJB	7 J	14 U	4 J	17 UJB	7 J
1,1,1-Trichloroethane	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
Carbon Tetrachloride	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
Bromodichloromethane	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
1,2-Dichloropropane	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
cis-1,3-Dichloropropene	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
Trichloroethene	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
Dibromochloromethane	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
1,1,2-Trichloroethane	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
Benzene	13 U	2 J	1 J	19 UJ	14 U	17 U	17 U	18 U
trans-1,3-Dichloropropene	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
Bromoform	13 U	15 U	12 UJ	19 UJ	14 U	17 U	17 U	18 U
4-Methyl-2-Pentanone	13 UJ	15 U	12 UJ	19 UJ	14 U	17 UJ	17 UJ	18 UJ
2-Hexanone	13 UJ	15 UJ	12 UJ	19 UJ	14 UJ	17 UJ	17 UJ	18 UJ
Tetrachloroethene	13 U	15 U	12 UJ	19 UJ	14 U	17 UJ	17 UJ	18 U
1,1,2,2-Tetrachloroethane	13 UJ	15 U	12 UJ	19 UJ	14 U	17 UJ	17 UJ	18 UJ
Toluene	13 U	35	23 J	19 UJ	14 U	17 UJ	17 UJ	18 U
Chlorobenzene	13 U	15 U	1 J	19 UJ	14 U	17 UJ	17 UJ	18 U
Ethylbenzene	13 U	45	74 J	4 J	14 U	17 UJ	17 UJ	18 U
Styrene	13 U	15 U	12 UJ	19 UJ	14 U	17 UJ	17 UJ	18 U
Xylene (total)	13 U	83	260 J	97 J	2 J	17 UJ	17 UJ	18 U
Total Number of TICS *	1	2	28	21	4	2	1	0

\* Number, not concentrations, of tentatively identified compounds (TICs).

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**Table C-2**  
**Semivolatile Organic Analysis for Sediment Samples**  
**Banner Western Disposal Service**

Compound	Sample Location							
	Concentrations in ug/kg							
	ST01	ST02	ST03	ST04	ST05	ST06	ST07	ST08
Phenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
bis(2-Chloroethyl)Ether	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2-Chlorophenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
1,3-Dichlorobenzene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
1,4-Dichlorobenzene	430 U	500 U	390 U	250 J	470 U	550 U	550 U	590 U
1,2-Dichlorobenzene	430 U	500 U	390 U	99 J	470 U	550 U	550 U	590 U
2-Methylphenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2,2'-oxybis(1-Chloropropane)	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
4-Methylphenol	430 U	500 U	390 U	250 J	470 U	28 J	550 U	20 J
N-Nitroso-di-n-propylamine	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Hexachloroethane	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Nitrobenzene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Isophorone	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2-Nitrophenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2,4-Dimethylphenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
bis(2-chloroethoxy)methane	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2,4-Dichlorophenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
1,2,4-Trichlorobenzene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Naphthalene	430 U	40 J	36 J	1600	25 J	230 J	75 J	68 J
4-Chloroaniline	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Hexachlorobutadiene	430 UJ	500 UJ	390 UJ	630 UJ	470 UJ	550 UJ	550 UJ	590 UJ
4-Chloro-3-methylphenol	430 U	26 J	390 U	630 U	470 U	550 U	550 U	590 U
2-Methylnaphthalene	430 U	500 U	25 J	840	470 U	240 J	62 J	53 J
Hexachlorocyclopentadiene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2,4,6-Trichlorophenol	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2,4,5-Trichlorophenol	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
2-Chloronaphthalene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
2-Nitroaniline	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
Dimethylphthalate	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Acenaphthylene	430 U	500 U	390 U	650	470 U	820	120 J	54 J
2,6-Dinitrotoluene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
3-Nitroaniline	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
Acenaphthene	430 U	500 U	20 J	370 J	470 U	45 J	550 U	38 J

**Table C-2 (Continued)**  
**Semivolatile Organic Analysis for Sediment Samples**  
**Banner Western Disposal Service**

Compound	Sample Location Concentrations in ug/kg							
	ST01	ST02	ST03	ST04	ST05	ST06	ST07	ST08
2,4-Dinitrophenol	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
4-Nitrophenol	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
Dibenzofuran	430 U	500 U	31 J	450 J	470 U	84 J	30 J	50 J
2,4-Dinitrotoluene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Diethylphthalate	430 U	500 U	390 U	630 U	470 U	140 J	550 U	590 U
4-Chlorophenyl-phenylether	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Fluorene	430 U	500 U	37 J	540 J	36 J	550 U	41 J	65 J
4-Nitroaniline	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
4,6-Dinitro-2-methylphenol	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
n-Nitrosodiphenylamine	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
4-Bromophenyl-phenylether	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Hexachlorobenzene	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Pentachlorophenol	1100 U	1200 U	980 U	1600 U	1200 U	1400 U	1400 U	1500 U
Phenanthrene	58 J	500 U	110 J	4900	90 J	1200	300 J	400 J
Anthracene	430 U	500 U	32 J	2100	44 J	670	180 J	160 J
Carbazole	430 U	500 U	35 J	630 U	35 J	73 J	20 J	39 J
di-n-butylphthalate	430 U	500 J	390 U	89 J	470 U	70 J	24 J	590 U
Fluoranthene	95 J	35 J	120 J	10000 D	180 J	2400	820	880
Pyrene	110 J	35 J	120 J	15000 D	240 J	4100 D	1000	980
Butylbenzylphthalate	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
3,3'-Dichlorobenzidine	430 U	500 U	390 U	630 U	470 U	550 U	550 U	590 U
Benzo(a)anthracene	52 J	500 U	60 J	4700	150 J	3500	800	540 J
Chrysene	73 J	42 J	78 J	9100 D	190 J	4400	1000	750
bis(2-Ethylhexyl)phthalate	430 U	500 UJB	390 UJB	9400 JBD	470 UJB	550 UJB	550 UJB	590 UJB
di-n-octylphthalate	430 U	500 U	390 U	100 J	10 J	550 U	18 J	590 U
Benzo(b)fluoranthene	49 J	27 J	61 J	14000	250 J	4200 D	1400	970
Benzo(k)fluoranthene	36 J	500 U	50 J	630 U	470 U	550 U	550 U	590 U
Benzo(a)pyrene	54 J	500 U	64 J	8000 D	160 J	4500 D	990	570 J
Indeno(1,2,3-cd)pyrene	34 J	500 U	48 J	7700 D	140 J	3200	760	360 J
Dibenz(a,h)anthracene	430 U	500 U	390 U	850	470 U	1400	280 J	71 J
Benzo(g,h,i)perylene	34 J	500 U	55 J	7600 D	110 J	2800	600	280 J
Total Number of TICs *	12	14	21	35	35	35	35	35

\* Number, not concentration, of tentatively identified compounds (TICs).

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Table C-3  
Pesticide/PCB Analysis for Sediment Samples  
Banner Western Disposal Service

Pesticide/ PCB	Sample Numbers / Concentrations in ug/kg							
	ST01	ST02	ST03	ST04	ST05	ST06	ST07	ST08
Alpha-BHC	2.2 U	2.6 U	2.0 U	3.3 U	2.4 U	2.8 U	2.8 U	3.0 U
Beta-BHC	2.2 U	2.6 U	2.0 U	3.3 U	2.4 U	2.8 U	2.8 U	3.0 U
Delta-BHC	2.2 U	2.6 U	2.0 U	6.3 JP	2.4 U	2.8 U	2.8 U	3.0 U
Gamma-BHC (Lindane)	2.2 U	2.6 U	2.0 U	27 JP	2.4 U	2.8 U	2.8 U	3.0 U
Heptachlor	2.2 U	2.6 U	2.0 U	23 JP	2.4 U	2.8 U	2.8 U	3.0 U
Aldrin	2.2 U	4.8 P	2.0 U	22 JP	2.4 U	2.8 U	2.8 U	3.0 U
Heptachlor epoxide	2.2 U	2.6 U	2.0 U	3.3 U	2.4 U	2.8 U	2.8 U	3.0 U
Endosulfan I	2.2 U	2.6 U	2.0 U	3.3 U	2.4 U	2.8 U	2.8 U	3.0 U
Dieldrin	4.3 U	5.0 U	3.9 U	57 JP	4.7 U	39 JP	5.5 U	5.9 U
4,4'-DDE	4.3 U	5.0 U	3.9 U	82 JP	4.7 U	5.5 U	5.5 U	5.9 U
Endrin	4.3 U	5.0 U	3.9 U	56 JDP	4.7 U	53 J	7.9 P	6.9 JP
Endosulfan II	4.3 U	5.0 U	3.9 U	44 JP	4.7 U	5.5 U	5.5 U	5.9 U
4,4'-DDD	4.3 U	5.0 U	3.9 U	100 JP	4.7 U	5.5 U	5.6 P	5.9 U
Endosulfan sulfate	4.3 U	5.0 U	3.9 U	27 JP	4.7 U	5.5 U	5.5 U	5.9 U
4,4'-DDT	4.3 U	5.0 U	3.9 U	61 JP	4.7 U	22 J	8.6 P	5.9 U
Methoxychlor	22 U	26 U	20 U	150 J	24 U	28 U	28 U	30 U
Endrin ketone	4.3 U	5.0 U	3.9 U	96 J	4.7 U	13 JP	9.0	5.9 U
Endrin aldehyde	4.3 U	7.5	4.4 P	97 JP	4.7 U	5.5 U	23 P	5.9 U
Alpha-chlordane	2.2 U	3.0	2.0 U	39 JP	2.4 U	2.8 U	2.8 U	3.0 U
Gamma-chlordane	2.2 U	2.6 U	2.0 U	37 JP	2.4 U	2.8 U	2.8 U	3.0 U
Toxaphene	220 U	260 U	200 U	330 U	240 U	280 U	280 U	300 U
Aroclor-1016	43 U	50 U	39 U	63 U	47 U	55 U	55 U	59 U
Aroclor-1221	87 U	100 U	79 U	130 U	96 U	110 U	110 U	120 U
Aroclor-1232	43 U	50 U	39 U	63 U	47 U	55 U	55 U	59 U
Aroclor-1242	43 U	50 U	39 U	63 U	47 U	55 U	55 U	59 U
Aroclor-1248	43 U	50 U	39 U	63 U	47 U	55 U	55 U	59 U
Aroclor-1254	43 U	210 C	39 U	9900 UX	47 U	55 U	55 U	59 U
Aroclor-1260	43 U	50 U	39 U	63 U	47 U	55 U	55 U	59 U

BANNER\TABLE C-3\DATA\PESTSED WK4

Table C-4

Inorganic Analysis for Sediment Samples  
Banner Western Disposal Service

Metals and Cyanide	Sample Number							
	Concentrations in mg/kg							
	ST01 Background	ST02	ST03	ST04	ST05	ST06	ST07	ST08
Aluminum	1630 J	6720 J	9570 J	9080 J	3750 J	8170 J	11500 J	9480 J
Antimony	0.49 B	1.3 B	8.4 B	1.1 B	0.56 U	2.3 B	0.83 B	1.1 B
Arsenic	4.5	8.4	21.2	10.1	6.2	30.1	8.1	14.2
Barium	14.3 B	59.3	307	78.2	26.3 B	175	84.6	95.5
Beryllium	0.18 U	0.25 U	0.44 U	0.32 U	0.28 U	0.38 U	0.31 U	0.36 U
Cadmium	0.37 B	0.59 B	65.4	4.6	0.92 B	9.8	2.5	4.3
Calcium	151000	76400	28800	35300	65200	43800	42200	61900
Chromium	3.8	13.9	523	51.4	11.1	136	34.5	29.7
Cobalt	4.1 B	8.8 B	10.5 B	6.9 B	5.4 B	8.0 B	9.7 B	11.3 B
Copper	4.5 B	16.7	408	38.4	10.2	174	56.9	38.9
Iron	7240	19500	23200	26400	11300	20100	20200	22200
Lead	3.9	24.5	564	49.1	12.2	443	50.2	34.4
Magnesium	84000	36000	14800	18800	32000	22300	21000	25000
Manganese	419 JN	496 JN	261 JN	263 JN	401 JN	383 JN	304 JN	689 JN
Mercury	0.10 U	0.14 U	5.2	0.89	0.12 U	4.1	0.25	0.17 U
Nickel	6.0 B	19.4	105	20.1	10.8 B	32.8	29.5	36.6
Potassium	1200 JE	2980 JE	2960 JE	2060 JE	1390 JBE	1640 JBE	3140 JE	2770 JE
Selenium	0.55 U	0.76 U	2.1 B	0.95 U	0.85 U	1.5 B	0.93 U	1.3 B
Silver	0.18 U	0.25 U	11.6	0.99 B	0.28 U	4.3	0.51 B	0.51 B
Sodium	225 B	2130	1510 B	547 B	439 B	314 B	371 B	289 B
Thallium	0.55 B	0.76 U	1.3 U	1.0 U	0.85 U	1.2 U	0.93 U	1.1 U
Vanadium	6.5 B	15.7	23.0	26.4	16.4	21.8	26.2	22.0
Zinc	19.6	67.1	2380	195	61.3	826	205	398
Cyanide	2.0 U	2.2 U	8.3	2.2 U	2.1 U	2.8 U	3.6 U	3.8 U

BANNERTABLE C-4SEDMETAL WK4

Table C-5  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
<b>Sample ST01</b>		
Volatile Organic Compounds		
Unknown	1.896	24 JB
Semivolatile Organic Compounds		
-Penten--ol	2.123	260 J
Unknown	3.014	160 J
3-Penten-2-one, 4-methyl	3.047	110 JNBA
Unknown	3.326	98 J
2-Pentanone, 4-hydroxy-4-met	3.422	4800 JNBA
Unknown organic acid	8.982	110 JB
Chrysene, -methyl-	16.656	90 J
Unknown Amide	17.590	430 JB
Unknown PAH	19.490	110 J
Unknown	20.091	210 J
Unknown	20.863	180 J
Unknown	22.956	120 J
<b>Sample ST02</b>		
Volatile Organic Compounds		
Unknown	1.884	15 JB
1,4-Dioxane	5.393	72 JN
Semivolatile Organic Compounds		
Unknown	2.124	200 J
3-Penten-2-one, 4-methyl-	3.047	220 JNBA
2-Pentanone, 4-hydroxy-4-met	3.433	5700 JNBA
Unknown alcohol	4.581	140 J
Acetophenone	4.979	150 JN
Diphenyl ether	7.426	120 JN
Unknown organic acid	8.982	170 JB
Unknown amide	14.982	1400 JB
Unknown amide	17.601	550 JB
Unknown organic acid	19.855	3700 J
Unknown organic acid	21.508	1300 J
Unknown organic acid	22.559	150 J
Unknown	23.686	190 J
Unknown	23.815	270 J

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
<b>Sample ST03</b>		
<b>Volatile Organic Compounds</b>		
Benzene, ethyl-methyl-	10.521	50 J
Benzene, trimethyl-	10.655	22 J
Benzene, ethyl-methyl-	10.934	44 J
Benzene, trimethyl-	11.190	46 J
Unknown hydrocarbon	11.494	21 J
Benzene, dichloro-	11.616	25 J
Benzene, ethyl-methyl-	11.786	100 J
Unknown cycloalkane	11.896	32 J
Unknown alkyl benzene	12.103	30 J
Benzene, methyl-propyl-	12.225	160 J
Benzene, ethyl-dimethyl-	12.335	280 J
Benzene, diethyl-	12.468	18 J
Benzene, methyl-propyl-	12.578	110 J
Unknown alkyl benzene	12.773	270 J
Benzene, ethyl-dimethyl-	12.883	350 J
Unknown alkyl benzene	13.041	69 J
Unknown alkyl benzene	13.176	64 J
Unknown alkyl benzene	13.322	110 J
Benzene, ethyl-dimethyl-	13.480	170 J
Benzene, tetramethyl-	13.566	220 J
Unknown alkyl benzene	13.761	52 J
Unknown alkyl benzene	13.870	76 J
Unknown alkyl benzene	13.992	120 J
Unknown alkyl benzene	14.139	28 J
Unknown alkyl benzene	14.200	180 J
Unknown alkyl benzene	14.346	51 J
Unknown alkyl benzene	14.456	40 J
Benzene, ethyl-dimethyl	14.833	30 J
<b>Semivolatile Organic Compounds</b>		
-Penten-ol	2.069	92 J
3-Penten-2-one, 4-methyl-	3.014	84 JNBA
2-Pentanone, 4-hydroxy-4-met	3.400	4100 JNBA
Unknown	8.981	340 J
Phenol, -(tetramethylbutyl)	9.110	240 J
Unknown organic acid	11.836	170 J
Unknown organic acid	11.965	110 J
Unknown	13.253	150 J
Unknown amide	13.672	81 J
Unknown amide	14.981	830 JB
Unknown amide	17.600	550 JB
Benzo(e)pyrene	18.330	140 JN
Unknown PAH	20.884	260 J

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
<b>Sample ST03--Semivolatile Organic Compounds (Continued)</b>		
Unknown	21.560	160 J
Olean-ene	21.732	83 J
-Amyrin	22.054	160 J
Unknown	22.215	89 J
Unknown	22.516	130 J
-Amyrin	23.020	210 J
Urs--en--oic acid, -oxo-, me	23.568	150 J
Unknown	24.158	110 J
<b>Sample ST04</b>		
<b>Volatile Organic Compounds</b>		
Unknown	1.921	26 JB
1,4-Dioxane	5.442	36 JN
Benzene, ethyl-methyl-	10.615	31 J
Benzene, trimethyl-	10.700	28 J
Benzene, ethyl-methyl-	10.967	40 J
Trimethylbenzene	11.232	46 J
Benzene, dichloro-	11.660	16 J
Benzene, trimethyl-	11.842	69 J
Unknown alkyl benzene	12.158	15 J
Benzene, methyl-propyl-	12.267	26 J
Benzene, ethyl-dimethyl-	12.377	37 J
Benzene, methyl-propyl-	12.620	16 J
Benzene, ethyl-dimethyl-	12.814	27 J
Benzene, ethyl-dimethyl-	12.936	37 J
Unknown alkyl benzene	13.094	11 J
Unknown alkyl benzene	13.215	10 J
Benzene, ethyl-dimethyl-	13.373	14 J
Benzene, ethyl-dimethyl-	13.531	19 J
Unknown alkyl benzene	13.616	32 J
Unknown alkyl benzene	14.054	11 J
Benzene, tetramethyl-	14.248	29 J
<b>Semivolatile Organic Compounds</b>		
2-Pentanone, 4-hydroxy-4-met	3.433	6100 JNBA
Benzene, (-methylethyl)-	4.034	1400 J
Benzene, diethyl-	4.700	620 J
Benzene, -methyl--propyl-	4.872	1700 J
Benzene, -methyl-(-methyleth)	4.915	2500 J
Benzene, -methyl-(-methyleth)	5.054	2200 J
Benzene, -methyl-(-methyleth)	5.097	3900 J
Unknown alkyl benzene	5.204	780 J
Benzene, -ethyl-dimethyl-	5.247	1300 J
Benzene, methyl--(-methyleth)	5.333	1600 J

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in  $\mu\text{g/kg}$

Compound Name	Retention Time	Estimated Concentration
Sample ST04--Semivolatile Organic Compounds (Continued)		
Unknwon	5.526	720 J
Benzene, (-methyl--propenyl)	5.559	2000 J
Unknown	5.623	780 J
Unknown	5.687	940 J
Unknown alkene	5.773	650 J
Unknown alkene	6.567	790 J
Unknown alkene	7.287	1000 J
Naphthalene, -dimethy-	7.694	1100 J
-Nonylphenol	10.217	580000 J
Unknown	10.378	5700 J
-Nonylphenol	10.474	7500 J
-Nonylphenol	10.571	4400 J
Phenol, -(tetramethylbutyl)	10.721	1800 J
Anthracene, -methyl-	11.848	840 J
Phenanthrene, -methyl-	12.063	1200 J
Unknown	12.717	600 J
11H-Benzo(fluorene	14.274	600 J
Dodecatricenoic acid, -trime	17.923	720 J
Unknown	19.705	910 J
Coprostan-3-one	19.984	1100 JN
Cholan-24-oic acid, 3-oxo	20.381	970 J
-Sitosterol	21.690	1100 J
Olean--ene	22.163	1700 J
Olean--ene	23.712	1900 J
Unknown	24.320	930 J
Sample ST05		
Volatile Organic Compounds		
Unknown	1.896	19 JB
1,4-dioxane	5.405	16 JN
Benzene, ethyl-methyl-	11.791	8 J
Unknown hydrocarbon	12.884	13 J
Semivolatile Organic Compounds		
Unknown alcohol	2.125	130 J
3-Penten-2-one, 4-methyl-	3.048	170 JNBA
2-Pentanone, 4-hydroxy-4-met	3.445	6200 JNBA
2-Butanone	3.542	190 JN
Unknown alcohol	4.594	160 J
Acetophenone	4.991	120 JN
Unknown alcohol	8.994	140 J
Phenol, -(tetramethylbutyl)	9.134	380 J
Phenol, nonyl-	10.046	130 JN
Unknown organic acid	10.347	170 J
Unknown alcohol	11.345	190 J

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
<b>Sample ST05--Semivolatile Organic Compounds (Continued)</b>		
Unknown organic acid	11.871	340 J
Unknown organic acid	12.010	380 J
Sulfur, mol. (S8)	12.998	210 JN
Phytol	13.199	170 JN
Unknown	13.277	130 J
Unknown organic acid	13.416	300 J
Unknown amide	15.005	790 JB
Unknown amide	17.635	510 JB
-Tridecatrienitrile, -trim	17.881	620 J
Unknown organic acid	18.611	460 J
Unknown organic acid	19.889	960 J
Cholesterol	19.931	210 JN
Unknown	20.007	140 J
Unknown	20.318	190 J
Unknown organic acid	21.552	220 J
Sitosterol	21.617	1000 J
-Amyrin trimethylsilyl ether	21.810	160 J
-Amyrin	22.078	250 J
Unknown	22.293	180 J
-Amyrin	22.583	600 J
Unknown	23.087	650 J
Unknown	23.602	120 J
Unknown	23.935	510 J
Unknown	24.257	590 J
<b>Sample ST06</b>		
<b>Volatile Organic Compounds</b>		
Unknown	1.896	20 JB
Hexane	3.608	9 JN
<b>Semivolatile Organic Compounds</b>		
Unknown	2.127	260 J
2-Pentanone, 4-hydroxy-4-met	3.447	7900 JNBA
1H-Indene, -methylene-	5.626	160 J
Benzocycloheptatriene	6.560	130 JN
Naphthalene, -ethenyl-	7.729	200 J
Unknown	8.996	320 J
Unknown PAH	10.348	1100 J
Unknown	10.445	2000 J
Dibenzothiophene, -methyl-	11.411	710 J
Anthracene, -methyl-	11.754	860 J
Anthracene, -methyl-	11.808	1100 J
Phenanthrene, -methyl-	11.883	1100 J
Phenanthrene, -methyl-	11.969	1800 J
Unknown organic acid	12.044	3000 J

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
<b>Sample ST06--Semivolatile Organic Compounds (Continued)</b>		
-Anthracenedione	12.409	1000 J
Phenanthrene, -dimethyl-	12.645	760 J
Phenanthrene, -dimethyl-	12.860	1900 J
Unknown	12.914	1100 J
Unknown PAH	13.300	2200 J
Pyrene, -methyl-	14.041	1200 J
11H-Benzo()fluorene	14.255	2500 J
11H-Benzo()fluorene	14.373	750 J
Pyrene, -methyl-	14.448	810 J
Pyrene, -methyl-	14.631	1700 J
Unknown	14.878	410 J
Unknown amide	15.049	720 JB
Benzo(naphthothiophene	15.468	470 J
Benzo(phenanthrene	15.532	480 J
7H-Benz(anthracen-one	16.305	490 J
Benz(anthracene, -methyl-	16.777	480 J
Unknown PAH	16.938	390 J
Unknown PAH	17.014	450 J
Unknown Ketone	17.668	350 J
Unknown	19.965	510 J
Unknown PAH	21.661	590 J
<b>Sample ST07</b>		
<b>Volatile Organic Compounds</b>		
Unknown	1.884	14 JB
<b>Semivolatile Organic Compounds</b>		
Unknown	2.130	340 J
3-Penten-2-one, 4-methyl-	3.049	190 JNBA
2-Pentanone, 4-hydroxy-4-met	3.446	8000 JNBA
Unknown	3.489	200 J
Unknown alcohol	4.595	170 J
Unknown	8.995	140 J
Unknown organic acid	10.347	780 J
Unknown organic acid	11.700	540 J
Anthracene, -methyl-	11.786	460 J
Unknown hydrocarbon	11.872	1600 J
4H-Cyclopenta(phenanthrene	11.947	1200 J
Unknown organic acid	12.022	2600 J
Unknown amide	12.140	530 J
Naphthalene, -phenyl-	12.333	610 J
Unknown	12.397	600 J
Phenanthrene, -dimethyl-	12.848	460 J
Unknown hydrocarbon	12.891	740 J
Unknown PAH	13.278	750 J

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
<b>Sample ST07--Semivolatile Organic Compounds (Continued)</b>		
Unknown organic acid	13.417	960 J
11H-Benzo(fluorene	14.222	1200 J
11H-Benzo(fluorene	14.351	440 J
Unknown amide	15.016	3000 JB
Unknown amide	17.646	1200 JB
-Tridecatriteneitrile, -trim	17.882	460 J
Benz(j)acephenanthrylene	18.118	260 J
Unknown	19.127	340 J
Unknown	19.943	300 J
Unknown	20.329	310 J
Stigmasterol	21.081	320 JN
-Sitosterol	21.617	1800 J
Unknown	22.165	290 J
Unknown	22.594	520 J
Stigmas-4-en-3-one	23.098	900 JN
Unknown	23.936	380 J
Unknown	24.258	290 J
<b>Sample ST08</b>		
<b>Volatile Organic Compounds</b>		
None		
<b>Semivolatile Organic Compounds</b>		
Unknown alcohol	2.094	3400 J
3-Penten-2-one, 4-methyl-	3.039	2000 JNBA
2-pentanone, 4-hydroxy-4-met	3.436	110000 JNBA
Unknown	3.543	1300 J
Acetophenone	4.992	1800 JN
Unknown organic acid	8.996	290 JB
Unknown	10.348	150 J
Unknown	11.346	140 J
Unknown hydrocarbon	11.872	470 J
4H-Cyclopental(phenanthrene	11.947	300 J
Unknown organic acid	12.012	550 J
-Anthracenedione	12.398	120 J
Unknown hydrocarbon	12.892	310 J
Sulfur, mol (S8)	13.021	500 JN
Unknown organic acid	13.418	290 J
11H-Benzo(fluorene	14.223	240 J
Unknown Amide	15.017	1100 JB
Unknown	16.638	150 J
Unknown	16.917	210 J
Unknown amide	17.636	560 JB
-Dodecatrien-ol, -trimethy	17.883	420 J
Cholesterol	19.933	210 JN

Table C-5 (Continued)  
Volatile and Semivolatile Organic Analysis for Sediment Samples  
Tentatively Identified Compounds  
Banner Western Disposal Service  
Concentrations in µg/kg

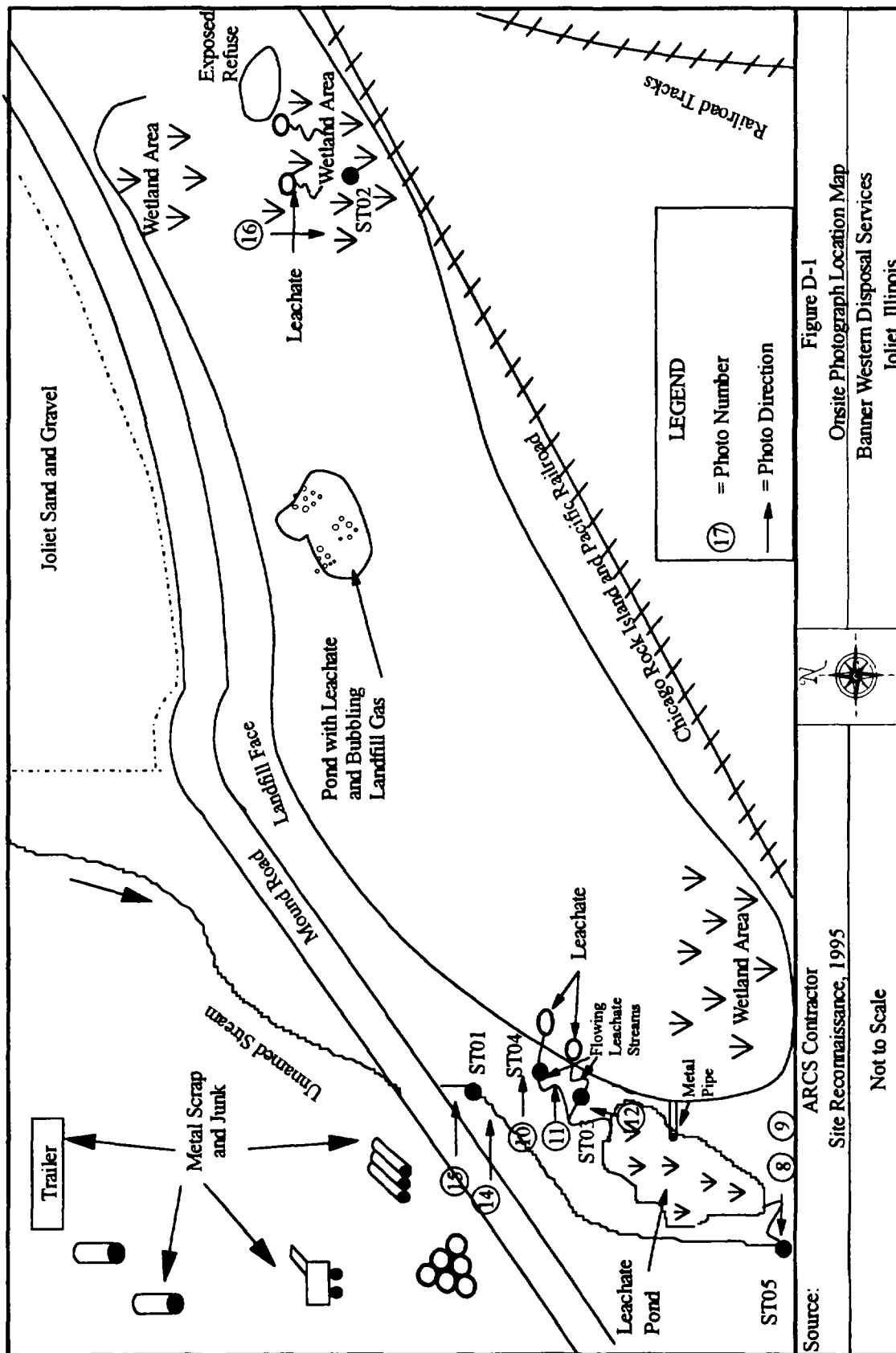
Compound Name	Retention Time	Estimated Concentration
Sample ST08--Semivolatile Organic Compounds (Continued)		
Cholestariol	20.019	210 JN
Unknown	20.319	250 J
Tetradecanal	20.491	150 JN
Unknown	20.792	160 J
Stigmasterol	21.071	160 JN
Sitosterol	21.629	1100 J
Olean--ene	21.811	240 J
Unknown	22.090	160 J
Unknown	22.155	250 J
Urs--ene	22.294	280 J
Unknown	22.595	700 J
Stigmast-4-en-3-one	23.099	480 JN
Cyclohexanone, 2,3,3-trimeth	24.269	610 JN

BANNER\DATA\TABLE C-5SD-TIC WK4

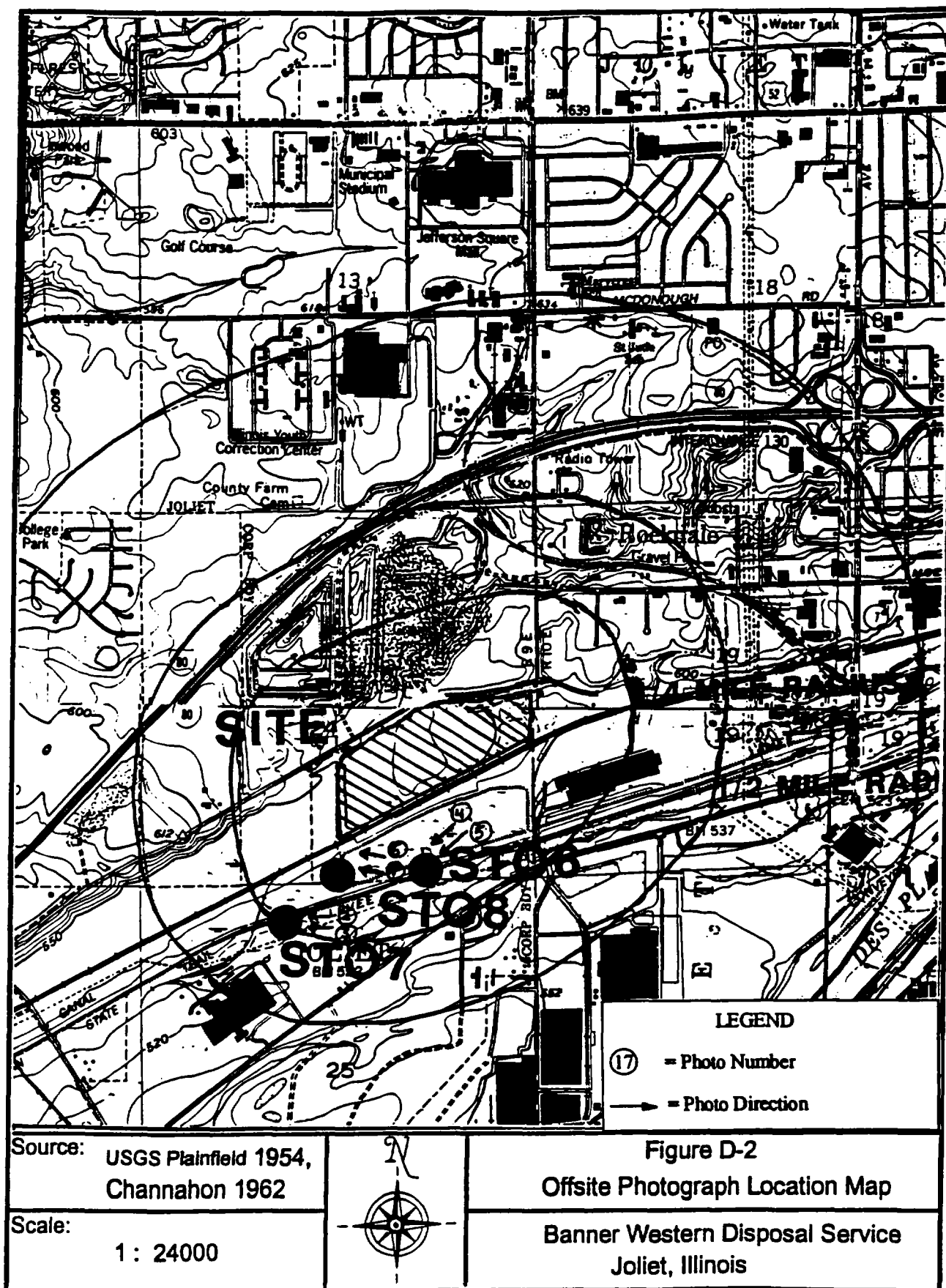
Appendix D

***Banner Western Disposal Service***

Site Photographs



FRE00337  
8.1.95



Date: 03/29/95

Time: 1421

Photo Taken By: Ralph Iovinelli

Photo Number: 2

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 180010068

Direction: West

Description: Closeup view of ST07 along the  
Illinois-Michigan canal (downstream location).  
View is to the west.



Date: 03/29/95

Time: 1421

Photographer: Ralph Iovinelli

Photo Number: 3

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 180010068

Direction: West

Description: Distant view of ST07 along the  
Illinois-Michigan canal (downstream location).  
View is to the west.



Date: 03/29/95

Time: 1500

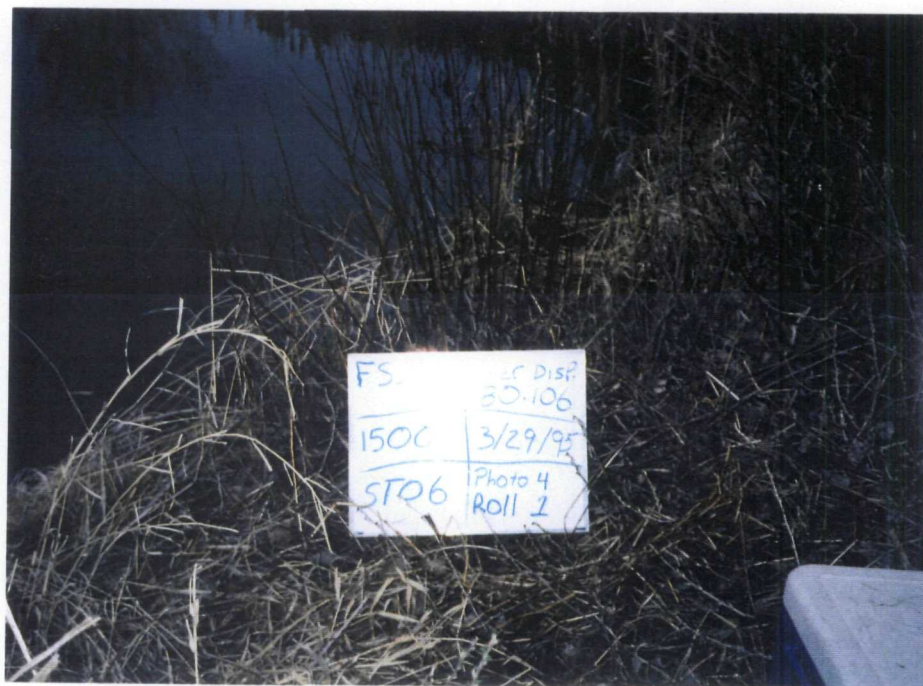
Photo Taken By: Ralph Iovinelli

Photo Number: 4

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: Southwest

Description: Closeup view of ST06 along the  
Illinois-Michigan canal (upstream location).  
View is to the southwest.



Date: 03/29/95

Time: 1500

Photographer: Ralph Iovinelli

Photo Number: 5

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: Southwest

Description: Distant view of ST06 along the  
Illinois-Michigan canal (upstream location).  
View is to the southwest.



Date: 03/29/95

Time: 1524

Photo Taken By: Ralph Iovinelli

Photo Number: 6

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 180010068

Direction: Northwest

Description: Closeup view of ST08 along  
unnamed creek (downstream of site) where  
drainage from other land merges with creek.  
View is to the northwest.



Date: 03/29/95

Time: 1524

Photographer: Ralph Iovinelli

Photo Number: 7

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 180010068

Direction: Northwest

Description: Distant view of ST08 along  
unnamed creek (downstream of site) where  
drainage from other land merges with creek.  
View is to the northwest.



Date: 03/29/95

Time: 1635

Photo Taken By: Ralph Iovinelli

Photo Number: 8

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: West

Description: Closeup view of ST05 where  
unnamed creek leaves site through covert  
under train tracks. This location is where the  
leachate pond merges with creek. View is to  
the west.



Date: 03/29/95

Time: 1635

Photographer: Ralph Iovinelli

Photo Number: 9

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: West

Description: Distant view of ST05 where  
unnamed creek leaves site through covert  
under train tracks. This location is where the  
leachate pond merges with creek. View is to  
the west.



Date: 03/29/95

Time: 1701

Photo Taken By: Ralph Iovinelli

Photo Number: 10

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 180010068

Direction: East

Description: Closeup view of ST04 along  
leachate stream flowing from top of landfill to  
the leachate pond. View is to the east.



Date: 03/29/95

Time: 1701

Photographer: Ralph Iovinelli

Photo Number: 11

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 180010068

Direction: East

Description: Distant view of ST04 along  
leachate stream flowing from top of landfill to  
the leachate pond. View is to the east.



Date: 03/29/95

Time: 1717

Photo Taken By: Ralph Iovinelli

Photo Number: 12

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: North

Description: Closeup view of ST03 along  
another leachate stream flowing from top of  
landfill to the leachate pond. View is to the  
north.



Date: 03/29/95

Time: 1753

Photographer: Ralph Iovinelli

Photo Number: 14

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: East

Description: Closeup view of ST01 along  
unnamed creek just south of Mound road.  
View is to the east.



Date: 03/29/95

Time: 1816

Photo Taken By: Ralph Iovinelli

Photo Number: 16

Location/ILT #: Banner Western Disposal  
Service Landfill/ILT 980 606 818

Direction: South

Description: Closeup view of ST02 in the  
wetlands on the southeast area of the site.  
View is to the south.

